REMARKS

This amendment and related remarks that follow are intended to place the subject application in condition for allowance. No new matter is introduced as a result of the claim amendments. In view of these amendments and the reasoning for allowance presented below, the applicant hereby respectfully requests further examination of the subject application.

1. Interview Summary

The applicants requested and were granted a telephonic interview with the Examiner. The interview took place on November 13, 2007 between the undersigned and Examiner A. Bayat. The applicants position as to the teachings of Rico as outlined below were discussed, as was as potential claim amendment now embodied in the change to Claim 1. No agreement as to patentability of the claims was reach during the interview. However, the Examiner stated he would consider the matter further.

2. Rejection of Claims 24-27 Under 35 USC §101

The aforementioned Office Action rejected Claims 24-27 of the subject application under 35 USC §101 as allegedly being directed to non-statutory subject matter. Claim 24 has been amended in order to overcome this rejection. As such, it is kindly requested that the rejection of Claim 24-27 be reconsidered based on the amended language of Claim 24.

3. Rejection of Claims 1, 4, 7-8 and 10-12 Under 35 USC §103(a)

The aforementioned Office Action rejected Claims 1, 4, 7-8 and 10-12 of the subject application under 35 USC §103(a) as being unpatentable over Rico et al. (U.S. Patent Application Publication No. US 2006/0167355 – hereinafter Rico) in view of Carson (U.S. Patent No. 4,277,684). More particularly, the Examiner stated that Rico discloses all the elements of these claims with the exception of providing for a

prescribed number of parallel rays, which is purportedly taught by Carson. The Examiner further contended that it would have been obvious to incorporate the teaching of Carson into Rico, thereby producing the claimed invention. The applicants have amended independent Claim 1 to highlight the differences between the cited art and the claimed invention, and believe the rejected claims are not obvious over the cited art for the following reasons.

The applicants claim, among other things, "**determining the thickness of the object** along each of a prescribed number of parallel rays directed through the object in the direction under consideration, normalizing the determined **thickness values of the object**, and **generating a thickness histogram for the object** from the normalized values". These actions are performed "for a prescribed number of directions". Also note that each action involves the object for which a representation is being generated.

Rico teaches determining thicknesses, normalizing thickness values and histogramming pixel intensity values (which purportedly can be converted to thickness values). However, these steps are never performed on or for the same object. More particularly, Rico discloses:

> "In step 80 of the flowchart of FIG. 13, a phantom mammogram is obtained by imaging a breast phantom 24. This phantom mammogram contains a series of profiles of the breast phantom along different planes, reflecting the difference in thickness of the breast phantom at these different planes. The image data for different thicknesses is then generated by imaging a three-dimensional triangular phantom 26. This triangular phantom contains slabs of PMMA, as well as plastics simulating 30 and 50% of fibroglandular tissue. By imaging this three-dimensional triangular phantom 26, image data for known and different thicknesses are generated. This information can then be combined with the information provided by step 80, to determine a phantom thickness map object 22 in step 84." (Paragraph [0052], lines 3-17)

11

Thus, the thicknesses of a three-dimensional triangular phantom are determined, and used to create a phantom thickness map object. The values of this phantom thickness map object are normalized to the thickness readout of the mammographic system (Paragraph [0046], lines 6-8). Thus, to equate to the aforementioned claimed elements, the claimed object for which a representation is being generated must be the breast phantom or the three-dimensional triangular phantom. However, the only histogram computed in the Rico scheme involves a digital mammogram of a women's breast—which is unrelated to either of the aforementioned phantoms. More particularly, it is stated in Rico:

> "Referring to FIG. 6, there is illustrated an intensity histogram 29 of a digital mammogram." (Paragraph [0047], lines 3-4)

Accordingly, if the object is the breast phantom or the three-dimensional triangular phantom, then Rico does not teach the claimed feature of "**generating a thickness histogram for the object** from the normalized values", as a histogram is never computed for either of these phantoms. And, if on the other hand, it is supposed that the breast imaged in the digital mammogram is the claimed object, then Rico does not teach either of the claimed features of "**determining the thickness of the object** along each of a prescribed number of parallel rays directed through the object in the direction under consideration" or "normalizing the determined **thickness values of the object**". This is because the only thickness determination along rays through an object and normalizing of thickness values taught in Rico involve the aforementioned phantoms.

As for the Carson reference, like Rico, it also does not teach the aforementioned claimed features performed in association with an object for which a representation is being generated. **Thus, as neither Rico, nor Carson, teach the aforementioned claimed features, the combination thereof does not teach these features either**.

In order to deem the applicant's claims unpatentable under 35 USC §103(a), a prima facie case showing obviousness must be made. To make a prima facie case showing obviousness, *all* of the elements of the recited claims must be considered,

especially when they are missing from the prior art. If a claimed element is *not* taught in the prior art and has advantages not appreciated by the prior art, then no prima facie case of obviousness exists. The Federal Circuit court has stated that it was an error not to distinguish claims over a combination of prior art references where a material limitation in the claimed system and its purpose was not taught therein (*In Re Fine*, 837 F.2d 107, 5 USPQ2d 1596 (Fed. Cir. 1988)).

In this case, the Rico-Carson combination lacks the aforementioned claimed features of "**determining the thickness of the object** along each of a prescribed number of parallel rays directed through the object in the direction under consideration, normalizing the determined **thickness values of the object**, and **generating a thickness histogram for the object** from the normalized values"—all of which involve the same object for which a representation is being generated. Thus, the applicant has claimed elements not taught in the cited art, and which has advantages not recognized therein—namely defining a directional histogram model of the object which is employed as a representation thereof that is substantially invariant in regard to translation and scaling. Accordingly, no prima facie case of obviousness can be established in accordance with the holding of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 USC 103 over Rico in view of Carson. As such, it is respectfully requested that Claims 1, 4, 7-8 and 10-12 be allowed based on the nonobvious claim language:

> "for a prescribed number of directions, determining the thickness of the object along each of a prescribed number of parallel rays directed through the object in the direction under consideration, normalizing the determined thickness values of the object, and generating a thickness histogram for the object from the normalized values". (as exemplified in Claim 1).

4. Rejection of Claims 5-6 Under 35 USC §103(a)

The aforementioned Office Action rejected Claims 5-6 of the subject application under 35 USC §103(a) as being unpatentable over Rico in view of Carson, and in further view of Itagaki et al. (U.S. Patent Application Publication No. US 2001/0051005 – hereinafter Itagaki). More particularly, the Examiner stated that the Rico-Carson combination teaches all the elements of these claims with the exception of quantizing the thickness values, which is purportedly taught by Itagaki. The Examiner further contended that it would have been obvious to incorporate the teaching of Itagaki into the Rico-Carson combination, thereby producing the claimed invention. The applicants have amended independent Claim 1 tò highlight the differences between the cited art and the claimed invention, and believe the rejected claims are not obvious over the cited art for the following reasons.

As stated previously, Rico teaches determining thicknesses, normalizing thickness values and histogramming pixel intensity values (which purportedly can be converted to thickness values). However, these steps are never performed on or for the same object. The thicknesses of a three-dimensional triangular phantom are determined, and used to with a mammogram of a breast phantom to create a phantom thickness map object. The values of this phantom thickness map object are normalized to the thickness readout of the mammographic system. But, the only histogram computed in the Rico scheme involves a digital mammogram of a women's breast— which is unrelated to either of the aforementioned phantoms.

Accordingly, if the object is the breast phantom or the three-dimensional triangular phantom, then Rico does not teach the claimed feature of "**generating a thickness histogram for the object** from the normalized values", as a histogram is never computed for either of these phantoms. And, if on the other hand, it is supposed that the breast imaged in the digital mammogram is the claimed object, then Rico does not teach either of the claimed features of "**determining the thickness of the object** along each of a prescribed number of parallel rays directed through the object in the direction under consideration" or "normalizing the determined **thickness values of the object**". This is because the only thickness determination along rays through an object and normalizing of thickness values taught in Rico involve the aforementioned phantoms.

14

As for the Carson and Itagaki references, like Rico, they do not teach the aforementioned claimed features performed in association with an object for which a representation is being generated. **Thus, as neither Rico, nor Carson, nor Itagaki teach the aforementioned claimed features, the combination thereof does not teach these features either**.

As the Rico-Carson-Itagaki combination lacks the aforementioned claimed features of "**determining the thickness of the object** along each of a prescribed number of parallel rays directed through the object in the direction under consideration, normalizing the determined **thickness values of the object**, and **generating a thickness histogram for the object** from the normalized values"—all of which involve the same object for which a representation is being generated, the applicant has claimed elements not taught in the cited art. In addition, these features have the aforementioned advantage that is not recognized in the cited combination. Accordingly, no prima facie case of obviousness can be established in accordance with the holding of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 USC 103 over Rico in view of Carson. As such, it is respectfully requested that Claims 5-6 be allowed based on the previously-quoted nonobvious claim language exemplified in Claim 1.

5. Objections To Claims 2-3 and 9

Claims 2-3 and 9 were objected to as being dependent upon a rejected base claim. The Examiner stated that they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The applicants at this time, however, respectfully decline to rewrite these claims because it is the applicants' position that the independent claim from which these claims depend is patentable.

6. Summary

The allowance of Claims 13-23 is gratefully acknowledged. However, in view of the amendments and arguments set forth above, the applicant respectfully submits that Claims 1, 4-8, 10-12 and 24-27 of the subject application are in condition for allowance as they do particularly point out and distinctly claim the subject matter which the applicant regards as his invention, and they are not obvious over the prior art cited by the Examiner. Accordingly, reconsideration of the rejection of these claims, and withdrawal of the objection to Claims 2-3 and 9, are respectfully requested. Finally, allowance of Claims 1-12 and 24-27 at an early date is courteously solicited.

Respectfully submitted,

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